SELF-CONTAINED TRANSPORTABLE LIFE SUPPORT SYSTEM

MICROFICHE APPENDIX

This patent application contains a microfiche appendix No. 712 fiches which is 41 pages, which contains a program listing for the computer program used in the practice of this invention.

FIELD OF THE INVENTION

The present invention relates generally to medical devices utilized to treat intensive care patients and more particularly to a self-contained transportable life support system which is utilized in the resuscitation, stabilization, and transport of medical patients such as heart attack victims, stroke victims, accident victims and battlefield casualties.

BACKGROUND OF THE INVENTION

The need to transport medical patients and persons suffering from various medical emergency conditions such as heart attacks, strokes, etc. is well-known. Medical personnel speak of a "golden hour" within which such a medical patient must be transported to a medical facility so that proper medical care can be provided therefor. The survival rate for such medical patients is greatly enhanced if they are transported to the medical facility within the golden hour.

However, as those skilled in the art will appreciate, it is often difficult to transport a patient to a remotely located medical facility in a timely manner, particularly within the golden hour. Frequently accidents occur at remote locations and thus require a substantial amount of time to transport the medical patient to a distant hospital. Also, in battlefield situations, it is frequently impossible to transport a casualty immediately. In either instance, a hospital may be located hundreds, if not thousands, of miles from a hospital, thus necessitating several hours of transport time. As such, it is frequently beneficial to perform various emergency medical procedures at the site of the medical problem, and then to attempt to provide ongoing medical care during transport. By providing such early emergency medical care and by continuing medical treatment during transport to a remote hospital, the mortality rate of such transported medical patients is substantially reduced.

It is well-known to use various different medical devices in the field, i.e., at locations remote from a medical facility, so as to enhance a medical patient's chance of survival. For example, it is well-known to use an ECG and a defibrillator upon heart attack victims, so as to monitor the condition thereof and so as to provide medical treatment therefor in the field.

Typically, the medical patient is placed upon a stretcher and then various different medical devices are used thereupon, as necessary. During transport the medical devices may either be temporarily disconnected from the patient or, alternatively, may be hand carried along therewith by additional personnel. However, disconnection of the medical devices from the patient results in the undesirable disruption of medical monitoring or treatment therefor. Hand carrying the medical devices along with the patient requires extra personnel, which may not be available, or for which there may not be adequate room within the transport vehicle.

As such, it is desirable to provide a system for transporting a medical patient wherein the medical devices are carried along with the stretcher. In an attempt to provide

such a system for transporting a medical patient while facilitating the continuous use of medical devices thereupon, the Mobile Intensive Care Rescue Facility (MIRF) was developed by the Royal Australian Army Medical Corp. The MIRF is intended to provide sufficient medical equipment to have the capabilities of an intensive care hospital ward. The MIRF is designed so as to facilitate the removal and replacement of the various pieces of medical equipment therefrom for maintenance. The MIRF is specifically designed to accommodate two major roles: the transfer of critically ill people from one point to another, such as from a ward to an x-ray room or from one hospital to another; and the bringing of life support systems quickly to the scene of an accident or other medical emergency.

The MIRF can be configured to include a blood pressure cuff, an invasive blood pressure monitor, a body temperature sensor, a heart rate sensor (finger clip sensor), an oxygen saturation sensor, an exhaled air carbon dioxide sensor, and an electrocardiograph, so as to facilitate medical monitoring of a patient. Further, the MIRF can include a ventilation system, a volumetric infusion pump, a syringe pump, a suction unit, and a defibrillator so at to facilitate medical treatment.

However, since the various medical devices of the MIRF are not integrated with the housing thereof, the inclusion of all of the medical devices results in a system having substantial weight. Further, since the various medical devices of the MIRF are not integrated with the housing thereof, the volume occupied thereby and the electrical power consumption of the medical devices thereof are not optimal.

As such, it would be desirable to provide an integrated system which utilizes a single power supply and which eliminates redundant components, so as to achieve a substantial reduction in weight, volume, and power consumption.

Another contemporary system is the MOBI described in U.S. Pat. No. 4,957,121, issued to Icenogle et al. on Sep. 18, 1990. The MOBI is similar to the MIRF in concept. That is, like the MIRF, the MOBI utilizes off-the-shelf medical devices which are contained attached to housing thereof, so as to be transportable therewith, thus eliminating disruptions in the medical care provided thereby during transport.

However, also like the MIRF, the MOBI is not an integrated system and thus possesses substantially greater weight, volume, and power consumption than desirable.

Further examples of such contemporary life support systems include those disclosed in U.S. Pat. Nos. 4,584,989; 4,352,991; 4,691,397; 3,304,116; and 3,341,246.

U.S. Pat. No. 4,584,989 discloses a life support stretcher bed adapted to accommodate patients in intensive or cardiac care units in hospitals. The life support stretcher bed is broadly adapted for electrical medical devices, medical supplies and features an under carriage including a support structural, wheels, a patient housing with a mattress, an electrical power source and supports for mounting the medical equipment.

U.S. Pat. No. 4,352,991 teaches a life support system adapted for field use in a vehicle with available power and includes electrically operable life support units, means for supporting the life support units, a patient stretcher, and a dc power source adapted for battery or remote power source.

U.S. Pat. No. 4,691,397 teaches a device for carrying the life supporting devices of a bedridden patient including a table like means for supporting the devices, an IV holder, wheeled transport means and a hospital bed footboard securing means.